

# **REPORT OF AQUATIC RESOURCES INVESTIGATION**

Section III, Salem Landing (68±acres) Thompson Road Murfreesboro, Rutherford County, Tennessee

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Project No. 240801109.00

Report Date: May 10, 2024

#### SIGNATURE OF ENVIRONMENTAL PROFESSIONALS

TTL, Inc. has performed an Aquatic Resources Investigation in general conformance with the scope and limitations of the U. S. Army Corps of Engineers Wetland Delineation Manual, 1987 Edition; the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region (2012); and the Tennessee Department of Environment and Conservation Division of Water Pollution Control: Guidance for Making Hydrologic Determinations (Version 1.5, 2020).

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May 10, 2024

Zachary B. Blair, PG, TN QHP Project Geologist Date

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Date

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## **1.0 INTRODUCTION**

TTL, Inc. (TTL) was retained by Ole South to perform an Aquatic Resources Investigation for an approximate 68-acre property located northwest of Thompson Road in Murfreesboro, Rutherford County, Tennessee. The property will hereafter be referred to in this report as the "area of review (AoR)." TTL reviewed readily available physical source maps and desktop records to understand hydrologic characteristics on and within the vicinity of the AoR. TTL conducted a field visit on April 25, 2024, and investigated areas where streams, wetlands, and/or ponds could potentially be located based on a review of physical maps and regulatory databases. *Based on our desktop and field review, one open water pond (0.29-acre) was observed at the northeast corner of the AoR. No other aquatic resources were identified within the AoR.* 

Activities within jurisdictional Waters of the U.S. (WOTUS) are regulated by the U.S. Army Corps of Engineers (USACE) and the Tennessee Department of Environment and Conservation Division of Water Resources (TDEC DWR). Authority to permit discharges (fill) within jurisdictional wetlands or non-navigable WOTUS is granted under Section 404 of the Clean Water Act (CWA) of 1972. Authority to permit work and placement of structures in navigable WOTUS is granted under Sections 9 and 10 of the Rivers and Harbors Act of 1899. For regulatory purposes under the CWA, wetlands are defined by the USACE as:

Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

The purpose of the HD Study is to differentiate watercourses as either streams or wet weather conveyances for TDEC DWR jurisdictional purposes. Per *Tennessee Code Annotated, Section* 69-3-103:

"Wet weather conveyance" means, notwithstanding any other law or rule to the contrary, manmade or natural watercourses, including natural watercourses that have been modified by channelization: (1) That flow only in direct response to precipitation runoff in their immediate locality; (2) Whose channels are at all times above the groundwater table; (3) That are not suitable for drinking water supplies; and (4) In which hydrological and biological analyses indicate that, under normal weather conditions, due to naturally occurring ephemeral or low flow there is not sufficient water to support fish, or multiple populations of obligate lotic aquatic organisms whose life cycle includes an aquatic phase of at least two months; "Stream" means a watercourse that is not a wet weather conveyance.

## 2.0 SITE DESCRIPTION

The AoR consists of an irregular-shaped tract of undeveloped land approximately 68 acres in size located northwest of Thompson Road in Murfreesboro, Rutherford County, Tennessee. Surrounding properties consist of residential development to the north, east, and west with undeveloped land to the south/southwest. The AoR is identified as Parcel ID: 123012.04 (owned by Rucker Donnell Foundation).

A Site Location & Topographic Map derived from the Murfreesboro, Tennessee USGS Quadrangle (dated 2022) showing the site boundary and topographic features is included as **Figure 1**. A Site Location and Aerial Photograph plan is included as **Figure 2**.

## 3.0 LITERATURE AND RECORDS REVIEW

Prior to conducting the field effort, TTL reviewed readily available physical source maps and desktop records to understand hydrologic characteristics on and within the vicinity of the AoR. These data sources and the review findings are described below.

#### 3.1 USGS Topographic Map

Topographic maps depict named linear watercourses such as rivers and perennial streams as well as unnamed blue-line tributaries. The maps also depict open water features (lakes, ponds) and include symbology for other aquatic features such as wetlands. TTL reviewed the USGS topographic quadrangle displayed in **Figure 1** to evaluate sloping conditions and mapped watercourses in the vicinity of the AoR.

The AoR slopes from an elevation of 730 feet (ft.) above mean sea-level (amsl) along the southwestern property boundary to an elevation of 660 ft. amsl along the northern property boundary. Surrounding properties show the same trend and slope to the north. A small circular pond is shown at the northeast corner of the AoR and a closed depression is shown approximately 500-feet southwest of the pond. Besides the pond, no other aquatic features are shown within the limits of the AoR.

#### 3.2 LiDAR/Hillshade Imagery

Light Detection and Ranging (LiDAR) data is created using a 3-dimentional point cloud where a laser pulse is emitted from an airplane sensor and data is reflected from the ground surface back to sensor. Hillshade is a digital elevation product using LiDAR that allows for landscape and detailed topographic analysis. TTL reviewed LiDAR/Hillshade data compiled for the AoR, which is included as **Figure 3**.

An area of lower elevation is shown at the northeast corner of the AoR. This area was observed during fieldwork and determined to be a pond (as discussed later in this report). Two apparent sinkholes are shown approximately 500 feet southwest of the pond on the east half of the AoR. These sinkholes were field-confirmed during the April 25, 2024 site visit.

#### 3.3 NRCS Mapped Soil Types

The United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey maintains a database of soil types (map units) for most areas of the United States. The maps and map unit descriptions can be used to determine the composition and properties of a unit which represents a large area dominated by one or more major types of soil. Map units are further classified with a rating of hydric, partially hydric, or non-hydric. These units are useful for planning purposes to provide an overall understanding of the soils that occur in a general area. However, due to the natural variability of the landscape, direct observation of soil profiles is necessary to identify hydric soil indicators.

A classification of "hydric" means that 100 percent (%) of the soil components listed for a given map unit are rated as hydric. "Predominantly hydric" means that more than 66% to less than 100% of soil components are hydric. "Partially hydric" means that more than 33% to less than 67% of soil components are hydric. "Predominantly non-hydric" means that more than 0% and less than 34% of soil components are hydric. "Not hydric" means that all soil components are rated as not hydric. A map of the soils located within the AoR and their associated hydric rating is presented in **Figure 4**, and the soil types are summarized in **Table 1** below.

Map Unit Symbol	Description	Properties	Hydric Description
BrA	Bradyville silt loam, 0 to 2 percent slopes	Found on flats, well drained, more than 80 inches to water table	Non-hydric
BtC	Bradyville-Rock outcrop complex, 2 to 12 percent slopes	Found on hillslopes, well drained, more than 80 inches to water table	Non-hydric

Table 1: Soli Map Unit Classifications	Table	1:	Soil	Мар	Unit	Classifications
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СрА	Capshaw silt loam, 0 to 2 percent slopes	Found on stream terraces, moderately well drained, about 42 to 60 inches to water table	Non-hydric
СрВ	Capshaw silt loam, 2 to 5 percent slopes	Found on stream terraces, moderately well drained, about 42 to 60 inches to water table	Non-hydric
GRC	Gladeville-Rock outcrop complex, 2 to 15 percent slopes	Found on flats, well drained, more than 80 inches to water table	Non-hydric
HcA	Harpeth silt loam, 0 to 2 percent slopes	Found on flats, well drained, more than 80 inches to water table	Non-hydric
TaB2	Talbott silt loam, 2 to 5 percent slopes	Found on hillslopes, well drained, more than 80 inches to water table	Non-hydric
TrC	Talbott-Barfield-Rock outcrop complex, 2 to 12 precent slopes	Found on hillslopes, well drained, more than 80 inches to water table	Non-hydric

According to information presented in the NRCS Web Soil Survey, all soil types identified within the AoR are considered non-hydric.

#### 3.4 National Wetland Inventory

The U.S. Fish and Wildlife Service (USFWS) maintains the National Wetland Inventory (NWI) database which contains information on the characteristics, extent, and status of the wetlands and deepwater habitats within the U.S. This information is useful for planning purposes to provide an overall understanding of wetland habitats that may be present on or around the AoR. The NWI classifies habitat types as marine, estuarine, riverine, lacustrine, or palustrine with additional modifiers as appropriate to identify the water regime, water chemistry, soil, or other characteristics based on *Classification of Wetlands and Deepwater Habitats of the U.S.* (Cowardin, 1979).

TTL reviewed the NWI data for the site using the USFWS NWI Wetlands Mapper web-based tool to determine the potential for wetlands and/or other aquatic features to exist within the AoR. A freshwater pond is mapped within a wooded are at the northeast corner of the AoR. The pond is described as a palustrine, unconsolidated bottom, permanently-flooded feature created by excavation (PUBHx). The location of this pond coincides with the small pond shown on the USGS Topographic Map (Figure 1). The NWI data/mapped pond shown within the limits of the AoR is included in **Figure 5**.

#### 3.5 Hydrologic Unit Code (HUC)

Watersheds are delineated by the USGS using a nationwide system where the U.S. is divided into hydrological units. Each unit is identified by a unique hydrologic unit code (HUC) ranging from 2 to 12 digits based on the six levels of classification in the hydrologic system (region, sub-region, basin, sub-basin, watershed, and sub-watershed).

The AoR falls within the Overall Creek 12-digit HUC sub-watershed (051302030204). This sub-watershed is located within the Stones 8-digit HUC sub-basin (05130203). A copy of the HUC Map is included as **Figure 6**.

#### 3.6 Normal Weather Conditions

TTL evaluated the normal weather conditions of the AoR to understand whether aquatic features in the landscape may exhibit certain characteristics related to current and past hydrologic regimes. TTL utilized the USACE Antecedent Precipitation Tool (APT) (Version 1.0) to evaluate climatological parameters and determine whether precipitation and other climatic variables were within the normal periodic range (i.e., seasonally and annually) prior to our site visit. Based on our review of information obtained from the APT data tool, the AoR had experienced "Drier Than Normal" weather conditions prior to our site visit on April 25, 2024.

Additionally, TTL reviewed climatological data from the Rockvale 4.5S, TN weather station which revealed 0-inches of rainfall had occurred 48-hours prior to our site visit and 0.71-inches had occurred 7 days prior to the visit. Copies of the APT output and the climatological data are included in **Appendix A**.

## 4.0 AQUATIC RESOURCES EVALUATION & METHODOLOGY

A Qualified Hydrologic Professional (QHP) with TTL conducted fieldwork on April 25, 2024. Weather conditions at the time of the visit were clear, sunny, and approximately 70° Fahrenheit.

#### 4.1 Stream/Watercourse Identification and Methodology/Findings

TTL did not identify watercourses within the AoR during the site visit on April 25, 2024.

#### 4.2 Wetland/Pond Findings

During the site visit, TTL evaluated the AoR for indications of wetlands; however, none were observed. TTL did observe one pond (Pond-1) in the northeast corner of the AoR. The center of the pond contained approximately 1 to 2 feet of standing water and the edges of the pond were surrounded by a manmade berm of soil. A PVC pipe approximately 4-inches in diameter was observed leading into the pond from the eastern adjoining property. Based on GPS data collected in the field and interpretation of LiDAR data, Pond-1 is approximately 0.29-acre in size. The location of Pond-1 is shown in **Figure 7**. Based on our site observations and data recorded in the field, no wetlands were identified within the limits of AoR during fieldwork. Photographs taken of Pond-1 are included in **Appendix B**.

## 5.0 CONCLUSIONS

TTL makes the following conclusions and opinions with regard to aquatic features within the AoR:

 Wetlands/Ponds – According to the USGS Topographic map (Figure 1) and the National Wetlands Inventory (NWI) map (Figure 5), a pond is shown on the northeast portion of the AoR. During fieldwork, TTL observed a 0.29-acre pond (Pond-1) at this location. Pond-1 was created within a closed depression and is surrounded by a manmade, built-up beam. No watercourses were observed flowing into or out of the pond. No wetlands were identified around the edges of the pond during field investigations.

Pond-1 is a manmade pond created in uplands. The pond is contained in single ownership and no watercourses flow into or out of the pond. Pond-1 does not appear to have a connection to other surface waters. *In our opinion, Pond 1 would be considered non-jurisdictional per the USACE and TDEC DWR. TTL recommends that this report be submitted to TDEC DWR for review and concurrence.* 

• **Watercourses** – Following review of maps and site observations, no linear watercourses were identified within the AoR.

TTL hopes this report will assist in understanding the site conditions and the hydrologic characteristics within the limits of the AoR. Please contact us if you have any questions.

## 6.0 **REFERENCES**

- Tennessee Department of Environment and Conservation Division of Water Pollution Control, *Guidance for Making Hydrologic Determinations*, Version 1.5, Chapter 1200-4-3 General Water Quality Criteria, dated April 2020.
- National Oceanic and Atmospheric Association Climatic Data Center, Climatology of the United States. Accessed at: http://cdo.ncdc.noaa.gov/climatenormals/clim81/TNnorm.pdf. April 2024.
- Natural Resources Conservation Service, Field Indicators of Hydric Soils in the United States, V. 8.2, dated 2018.
- Natural Resources Conservation Service National Water and Climate Center, Field Office Technical Guide, Soil Climate Analysis Network. Accessed at: https://www.wcc.nrcs.usda.gov/about. April 2024.
- U.S. Army Corps of Engineers, Wetland Delineation Manual, dated 1987.
- U.S. Army Corps of Engineers, Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region, dated 2012.
- U.S. Department of Agriculture, Natural Resources Conservation Service, Web Soil Survey. Accessed at: http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm. April 2024.
- U.S. Fish and Wildlife, National Wetland Inventory Mapper. Accessed at: www.fws.gov/wetlands/Data/Mapper.html. April 2024.
- U.S.G.S. Topographic Map for the Murfreesboro, Tennessee Quadrangle, dated 2022.

## FIGURES

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**Figure 1 - Site Location and Topographic Map** Ole South Properties - Salem Landing Section III Aquatic Resource Delineation Murfreesboro, Rutherford County, Tennessee Source: USGS 7.5 Minute Topo Murfreesboro 2022

2,000 Feet

1:24,000

1 Inch

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Figure 2 - Site Aerial Map Ole South Properties - Salem Landing Section III Aquatic Resource Delineation Murfreesboro, Rutherford County, Tennessee Source: ESRI World Aerial Imagery 3/4/2023 (Accessed 4/22/2024)







86.484°W 35.778°N

















TTL Figure 5 - USFWS National Wetland Inventory Map Ole South Properties - Salem Landing Section III Aquatic Resource Delineation Murfreesboro, Rutherford County, Tennessee Source: USFWS NWI, ESRI World 3/4/2023 (Accessed 4/22/2024)







Ole South Properties - Salem Landing Section III Aquatic Resource Delineation Murfreesboro, Rutherford County, Tennessee Source: USGS HUC Data, USGS Topo Maps 3/4/2023 (Accessed 4/22/2024)

HUC 8 - 05130203 - Stones

0 1 lhch 34,000 Feet



**Figure 7 - Aquatic Resource Delineation** Ole South Properties - Salem Landing Section III Aquatic Resource Delineation Murfreesboro, Rutherford County, Tennessee Source:: ESRI World 3/4/2023 (Accessed 4/22/2024)





## APPENDIX A

Antecedent Precipitation Tool & Climatological Data

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Duny loca		Daily	Total
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Ţ	Jul 202	4 Aug 4 2024		Aug 2024	Sep 2024		
ondition Va	alue	Month Weight			Product		
	1		3	3			
	2		2	4			
	2		1		2		
				Drie	r than Normal - 9		
$\Delta$ weighted $\Delta$ Days Normal Days Ar		Days Antecedent					
79.69		2.856		6789	86		
54.134		0.756		169	0		
27.887		1.032	118		4		
30.84		2.115		2	0		
49.869		4.471		854	0		
9.843		6.756		2989	0		
200.131		9.603		4	0		
214.895		10.778	427		0		

# Climatological Data for ROCK VALE 4.5S, TN (CoCoRaHS) - April 2024

Date	Max Temperature	Min Temperature	Avg Temperature	GDD Base 40	GDD Base 50	Precipitation	Snowfall	<b>Snow Depth</b>
2024-04-01	М	М	М	М	М	0.00	0.0	М
2024-04-02	М	М	М	М	М	Т	М	М
2024-04-03	М	М	М	М	М	1.00	М	М
2024-04-04	М	М	М	М	М	0.29	М	М
2024-04-05	М	М	М	М	М	0.00	0.0	М
2024-04-06	М	М	М	М	М	0.00	0.0	М
2024-04-07	М	М	М	М	М	0.00	0.0	М
2024-04-08	М	М	М	М	М	0.18	М	М
2024-04-09	М	М	М	М	М	Т	М	М
2024-04-10	М	М	М	М	М	0.35	М	М
2024-04-11	М	М	М	М	М	0.04	М	М
2024-04-12	М	М	М	М	М	0.75	М	М
2024-04-13	М	М	М	М	М	0.00	0.0	М
2024-04-14	М	М	М	М	М	0.00	0.0	М
2024-04-15	М	М	М	М	М	0.00	0.0	М
2024-04-16	М	М	М	М	М	0.00	0.0	М
2024-04-17	М	М	М	М	М	0.00	0.0	М
2024-04-18	М	М	М			0.55	М	М
2024-04-19	М	М	М			0.04	М	М
2024-04-20	М	М	М			Т	М	М
2024-04-21	М	М	М /	days previou	IS	0.12	М	М
2024-04-22	М	М	M ra	$\inf all = 0.71$	-inches	0.00	0.0	М
2024-04-23	М	М	М			М	М	М
2024-04-24	М	М	М			Т	М	М
2024-04-25	М	М	M Day of	of site visit 4	/25/24	0.00	0.0	М
2024-04-26	М	М	М	М	М	0.05	М	М
2024-04-27	М	М	М	М	М	0.00	0.0	М
2024-04-28	М	М	М	М	М	0.00	0.0	М
2024-04-29	М	М	М	М	М	0.00	0.0	М
2024-04-30	Μ	Μ	М	М	М	0.87	М	М
Average Sum	Μ	М	Μ	Μ	Μ	4.24	0.0	Μ

## APPENDIX B

Site Photographs

#### **Report of Aquatic Resources Investigation – Site Photographs**

TTL Project No. 240801109.00 Thompson Road • Murfreesboro, Rutherford County, Tennessee Photos taken April 25, 2024



Photo 1 - View of Pond-1, facing southeast. (35.784374, -86.485534).



Photo 2 – View of Pond-1, facing south.



## **Report of Aquatic Resources Investigation – Site Photographs**

TTL Project No. 240801109.00 Thompson Road • Murfreesboro, Rutherford County, Tennessee Photos taken April 25, 2024



Photo 3 – View of Pond-1, facing north.



Photo 4 – View of Pond-1, facing west.



#### **Report of Aquatic Resources Investigation – Site Photographs**

TTL Project No. 240801109.00 Thompson Road • Murfreesboro, Rutherford County, Tennessee Photos taken April 25, 2024



**Photo 5** – View of 4-inch pipe leading into the pond from the adjoining property to the east.



Photo 6 – View of Pond-1, facing south.





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